

1

# ADJUSTABLE PEDAL-PARALLEL SCREW AND ROD

## BACKGROUND OF THE INVENTION

### 1. Technical Field

The subject invention relates to an adjustable pedal assembly of the type attached to an automotive vehicle to control the brake, clutch and/or throttle in normal operation but which can be adjusted to a different position to accommodate a different driver position.

### 2. Description of the Prior Art

Foot operated pedals are provided for controlling the brakes, clutch, and engine throttle in automotive vehicles. Pedal assemblies have been recently developed wherein the position of pedal can be adjusted to accommodate different operators and/or driving positions. One group of such assemblies include a guide rod slidably supporting a pedal support with a pedal lever mounted on the support. A screw is included for driving the pedal support along the rod between various adjusted positions. However, the screw is disposed within the guide rod which complicates the drive connection between the pedal support and the screw. Variations of such assemblies are disclosed in U.S. Pat. Nos. 3,643,525; 4,875,385; 4,989,474; 5,078,024; 5,460,061; 5,697,260; 5,722,302 and 5,819,593.

With the constant desire to reduce weight and cost, there remains the corresponding need for simplified combinations to reduce the number of components, the combined weight and the manufacturing operations.

## SUMMARY OF THE INVENTION AND ADVANTAGES

An adjustable pedal assembly comprising a guide rod, a pedal support slidably supported on the guide rod, a pedal pivotally mounted on the support, and a screw for driving said pedal support along the rod. The assembly is characterized by the screw being external to and parallel to the guide rod.

The combination of the subject invention reduces the number of components, the combined weight and the manufacturing operations. In a more specific sense, there is no need to bore out the center of the guide rod to insert the screw when the screw is located external to and parallel to the guide rod. This feature allows for a solid guide rod to be used, saving money and time in manufacturing the product.

## BRIEF DESCRIPTION OF THE DRAWINGS

Other advantages of the present invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

- FIG. 1 is a perspective view of a first embodiment;
- FIG. 2 is a perspective view of a second embodiment; and
- FIG. 3 is a perspective view of a third embodiment.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the Figures, wherein like numerals or numerals separated by one hundred, indicate like or corresponding parts throughout the several views, an embodiment of an adjustable pedal assembly constructed in accordance with the subject invention is generally shown at 10, 110 and 210, respectively, in FIGS. 1, 2 and 3, respectively.

2

Each adjustable pedal assembly 10, 110 and 210 includes a guide rod 12. The guide rod 12 in the embodiment of FIGS. 1 and 3 is D-shaped as viewed in cross section to provide a key or flat surface 13. A bracket 14 or 214 is adapted for attachment to the structure of a motor vehicle and the guide rod 12 is fixed to and extends from the bracket 14 or 214.

A pedal support 16, 116 or 216 is slidably supported on the guide rod 12. A pedal lever 18, 118 or 218 is mounted on the support 16, 116 or 216 and includes a pedal pad 20 at its lower distal end. A screw 22 extends from the bracket 14 or 214 for driving the pedal support 16, 116 or 216 along the guide rod 12. The screw 22 threadedly engages the support 16, 116 or 216 whereby the support 16, 116 or 216 moves along the guide rod 12 in response to rotation of the screw 22. A drive mechanism 24, 124 or 224 for rotating the screw 22 comprises a gear box which may be driven by an electric motor 26. In the embodiment of FIGS. 1 and 2, the drive mechanism 24 or 124 is disposed on the guide rod 12 adjacent the bracket 14, i.e., the drive mechanism 24 or 124 is secured to both the guide rod 12 and the bracket 14. However, in the embodiment of FIG. 3, the bracket 214 is defined by a housing and the drive mechanism 224 is disposed in the housing of the bracket 214, (the motor not being shown in FIG. 3).

The adjustable pedal assemblies 10, 110 and 210 are characterized by the screw 22 being external to and parallel to the guide rod 12. In the embodiment of FIGS. 1 and 2, the pedal lever 18 or 118 is pivotally attached to the support 16 or 116. A pin such as that shown at 28 in FIG. 1 secures the pedal levers 18 and 118 to the respective supports 16 and 116. In addition, a torsion spring 30 surrounds the pin 28 to react with the pedal levers 18 and 118 to provide a resistance to pivotal movement thereof. It is important to use a pedal assembly which provides for a hysteresis effect to allow an operator advancing a pedal using foot pressure to have to use greater pressure for pedal advancement than that required to maintain a fixed position. This effect is important in maintaining the pedal in position while driving at a relatively constant speed and it must be considered in achieving a desired deceleration time. The hysteresis effect lessens the load to maintain a setting of the pedal, yet there is still enough force to cause reverse pedal action when a foot applied pressure is removed. The torsion spring 30 provides such a hysteresis effect.

In order to transmit a signal responsive to pivotal movements of the pedal levers 18 and 118, an electrical signal generator 32 or 132 is supported by each of the pedal supports 16 and 116 for generating an electrical signal, which, in turn, controls the brake system or throttle.

On the other hand, the bracket 214 of the embodiment of FIG. 3 includes a connection 36 for rotatably supporting the bracket 214 on a vehicle in response to pivotal movement of the pedal lever. A pin 36 rotatably supports the bracket 214 on the vehicle structure 38. The pedal lever 218 and the support 216 are defined by an integral or one piece plastic member which threadedly engages the screw 22 and is in sliding engagement with the guide rod 12. The integral one piece member extends downwardly from the guide rod 12 to a pedal pad 20 end. The top end of the integral one piece member includes an element connector 40 adapted for connection to an element to be controlled, such as a cable assembly leading to the brake system or throttle.

The screw 22 and the guide rod 12 extend from the brackets 14, 114 and 214 to distal ends. These distal ends are cantilevered or unconnected in the embodiment of FIG. 1 whereas a cap 142 or 242 interconnects the distal ends in the